

Discussion Papers in Economics

An Analysis of Corporate Performance and Governance in India: Study of Some selected Industries

Diganta Mukherjee

Tejamoy Ghosh

Discussion Paper 04-19



Indian Statistical Institute, Delhi
Planning Unit
7 S.J.S. Sansanwal Marg, New Delhi 110 016, India

An Analysis of Corporate Performance and Governance in India: Study of Some Selected Industries

Diganta Mukherjee and Tejamoy Ghosh*
Indian Statistical Institute, Kolkata, India

Address for Correspondence:

Diganta Mukherjee
Economic Research Unit
Indian Statistical Institute
203, B.T. Road, Kolkata – 700 108
INDIA

E_mail address: diganta@isical.ac.in, digantam@hotmail.com

Fax : +91-33-2577-6680, 8893

* The authors are grateful to Professors K.B. Sinha, D. Dasgupta and S. Gangopadhyay of ISI for their help and encouragement in this work. The research for this paper was partially supported by the Planning and Policy Research Unit of ISI, Delhi centre. We would also like to thank them for letting us use the Prowess database. This paper has benefited from the referee's comments at the Capital Markets Conference, 2003, Indian Institute of Capital Markets. The general disclaimer applies.

Abstract

Corporate governance mechanisms have been an important issue of enquiry for the researchers in financial economics. Both theoretical models and empirical analysis have been developed in this area to explain the occurrence of different contractual mechanisms and their efficacy in terms of improving managerial performance. A related issue in this literature is the independence and competence of the Board of Directors. The Indian corporate scenario was more or less stagnant till the early 90s but, after the liberalisation of the 90s, the position and goals of the Indian corporate sector changed a lot. This paper, using only balance sheet information from 4 selected sectors of the Indian industry, analyses the efficacy of corporate governance. Our findings, by and large, paint a disappointing picture. Overall, the conclusion seems to be that corporate governance is still in a very nascent stage in the Indian industry. The decision and policy making is still taken mostly as a routine matter. Among the institutional investors also, it seems that the FIIs are the most consistent in stock picking whereas the performances of the domestic institutional investors are sporadic and volatile at best. This is also serious shortcoming on the part of the capital market, not being able to enforce better governance on the part of the directors or performance on the part of the managers.

Keywords : Corporate governance, Agency problem, R&D, Import, Borrowing, Equity,
Utilization of capital, Regression model, Correlation coefficient

JEL Classification : G31, G32

An Analysis of Corporate Performance and Governance in India: Study of Some Selected Industries

I. Introduction: The issue of Corporate Governance

“Corporate Governance mechanisms are economic and legal institutions that can be altered through the political process – sometimes for the better.” – Shleifer & Vishny (1997).

Even if we agree that competition is the best mechanism for achieving economic efficiency through cost minimisation, as predicted by the ‘evolutionary view of economic changes’ (Alchian, 1950, Stigler, 1958), the importance of Corporate Governance cannot be overlooked if we keep in mind issues like informational asymmetries and agency problems.

The agency problem, stemming essentially from the separation of ownership and control¹, is the backbone of the contractual view of the firm (Coase, 1937, Jensen & Meckling, 1976 and Fama & Jensen, 1983). In most cases an investment project is financed and managed by separate people. The financier and the manager/entrepreneur enter into a contract. But, as the contractual view notes, it is impossible to specify all future contingencies in the contract, and hence complete contracts are not feasible. The decision making power in case a situation not specified in the contract arises is referred to as the residual control – this is addressed to in the theory of ownership. This residual control right is conferred on the managers most of the times essentially because of the financiers’ lack of technical expertise to run a project (this, in fact is also the major reason why fund owners get to depend on managers for investing their money). This gives them (the managers) some discretionary power in fund allocation, etc. A major portion of corporate governance deals with the limits to this discretionary power. Hence the first issue is management’s discretionary power resulting from technological infeasibility of a complete contract. The managers, in deed, have enough control power over decisions like fund allocation even to expropriate investors money through many avenues, and this happens to be a frequently observed problem that concerns investors. Also entrenchment of poorly performing managers is another very important problem.

¹ On these issues, see Tirole (1988) and Brealey and Myers (1997).

Yet another serious issue where agency problem manifests itself is the choice of projects by managers. They often pick projects that benefit themselves and cost the investors dearly. In such a situation Coase theorem (1960) might seem ideal to be applied, but problem of agreement between numerous investors prevents its application. In fact, the J-M (1976) view that managers pick inefficient projects when they donot have equity holdings has been empirically supported. Often a performance sensitive, long term incentive contract is thought of as a way out, but this might generate ex-post inefficiency and costs huge amounts to investors/financiers.

IA. The Indian scenario

There has been a recent focus on corporate governance among the financial researchers worldwide, and in particular in India. The main issue seems to be the independence of non-executive directors (The Hindu, 2001, several articles)². Indian industry is now witnessing the transition from sinecures (hand picked directors) to professionally competent and independent non-executive directors on the board, but this will not be easy. Very few such competent people are in supply. Any suitable candidate needs to have a public stature to inspire confidence in the shareholders. She should also be able to contribute to the company and not merely contest the management. Ideally, they should be prominent industrialists and not friends or promoters of the manager.

The change of goals and facets of the Indian corporate have been significant. The scenario in the Pre-Liberalisation period was very depressing as demand always exceeded supply due to government imposed quotas, “licenses”. This was supposed to check the extent of control owned by single individuals. The main issues facing a CEO at that period was

- Where to invest excess cash
- How to acquire more capacity
- How to improve capacity utilization

The corporate culture devolved around the managers oiling the bureaucrats / ministers for licenses. This attitude percolated through the corporate sector. Quality and price was not market determined (as demand always exceeded supply) which resulted in low quality, cost ineffective

² Of course this is not the only major issue addressed by researchers. Another salient issue being the exploitation of minority shareholders by the promoters. But, as this will be mitigated when corporate governance improves, we do not address this issue here directly.

technology. Also the consumers were not aware of the gap between international and domestic standards of products and services.

After the Liberalization, consumers now have a choice. The Indian market is large and hence very attractive. As a consequence MNCs flooded the market. The companies from the developed countries, where they were facing a saturated market came to invest in India either as green field ventures (Samsung), acquiring an Indian business (Coca Cola, Heinz) or Joint Ventures (JVs) (Pal – Peugeot, Tata – IBM).

Initially JV was most popular, but that changed later (splits like Premier Automobiles – Automobile Peugeot, Tata and IBM, DCM and Daewoo) (See Roychowdhury and Roychowdhury, 2001 for an interesting theoretical discussion on the issue of JV life cycle.).

In the Indian condition, often the key was cheap labour, and hence the importance of having good senior management who were very aware of local conditions was great. Public sector units (PSUs) came under huge threat. Because, with liberalization, there came government divestment. The management came under pressure to show efficiency and profitability. And there was considerable brain drain – all the brighter PSU employees went to the private sector as job opportunities boomed. Family owned businesses were forced to turn professional or enter into contractual arrangements with larger houses.

Roy (1999) studied Takeovers and Mergers (T&M) in India: one important instrument of corporate governance. She used data from CMIE for the years 1995 – 7. She observed that the mergers were mostly horizontal (allocational efficiency motive) of loss making or performance detoriating companies, mostly within same business group. The number is on the increase. Eg. Some of the Tata group companies.

A possible motive for this could be that Liberalization in the 90's worked as a threat of competition from the MNCs, which triggered T&M as response from the domestic companies. They were facing resource constraints in terms of both

- human capital (internal labour market) and
- finance (external selection)

Now mergers within same group imply that financial resource increase is smaller. So human capital is apparently the main motive behind these T&M activities.

IB. Plan of the Paper

This paper is organized into 4 main sections. The next section outlines the background of our analysis and the methodology adopted. Several subsections briefly describe the industrial sectors we will be studying, the database that we use for this purpose, the model used in our analysis and the definition of the major variables under consideration. Section 3 then presents the main analysis again separated into subsections containing the hypotheses to be tested and the results of the analysis with discussion. Finally, section 4 summarizes our findings and concludes. We append the relevant regression results and correlation tables to the end of the paper.

II. The Background of the Analysis

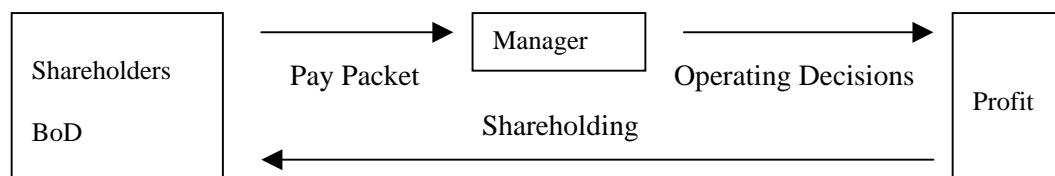
The empirical research on corporate governance in developed countries like the USA, Germany etc. focus on the following issues. For a detailed discussion on these and other issues, see the excellent surveys by Shleifer and Vishny (1997) and Denis (2001) among others.

- (i) The activity level of the Board of Directors (BoD), taking into account the number of times they meet, the independence of the board, their average age etc. (Cadbury Report, 1992, Tirole, 1999).
- (ii) The compensation package of the executives, like the salary package they are offered, whether it is pegged to performance and how, the stock options that are given etc. (Baker, Jensen and Murphy, 1988, Conyon and Sadler, 2001, Murphy, 1999).
- (iii) The level of competition in the managerial labour market by looking at the average number of years the managers hold down one job or the turnover rates (Morck, Shleifer and Vishny, 1989, Tirole, 1999).
- (iv) The role of ownership patterns on corporate performance by looking into investor activism, inside ownership and block shareholders' role in corporate governance (Hull and Mazachek, 2001, Hoderness, 2001, Denis, 2001).

All these analyses can be carried out meaningfully in these countries, as the relevant data are available on a systematic basis for researchers. We face a totally different scenario when we attempt to analyse this issue of corporate governance for the Indian industrial sector. Not only do we not find data on the above mentioned variables, it is also very difficult to get a balanced panel of data for a reasonable number of years and with a reasonable number of firms on which reliable data is obtained. The solution that we take recourse to in this paper is to use the Prowess (CMIE) database and try to locate balance sheet variables that might be used to identify governance mechanisms and reactions to it by the managers. We introduce Prowess below.

More specifically, we focus on financial decisions taken by a firm (i.e. managers) and its impact on performance. We then juxtapose this linkage with ownership variables and try to find any possible relationship among these. We do not know the managerial compensation offered by the BoD. What we can observe are the decisions taken by the management and its effect on profit. We can also observe the shareholding of the BoD, which determines their incentives. Thus, what we are trying to do here is essentially estimating the hidden delegation mechanism layer in a delegated optimisation problem from the observable operating decisions layer. So, in spirit, we are estimating a neural network model³ where the lower layer is observable but the upper one is not.

The following schematic diagram outlines our argument. We can not observe the “pay packet” link, but can observe the other two and hence we have to infer the unobservable one.



This exercise is done for four of the important sectors of the Indian industry, namely (i) Electrical machinery, (ii) Pharmaceuticals, (iii) Software and (iv) Textiles. The first and the fourth sector are chosen as the more traditional ones that are now, nevertheless, are facing major changes due to the financial liberalisation in the 1990s. The other two are chosen to represent the new technology sector where innovations and changes are rife. Below, we discuss some of the salient points about these four sectors.

IIA. The Sectors Analyzed⁴

Electrical Machinery

Since globalization, competing and delivering in the international market has become necessary. This calls for efficient management of resources and developing / adopting more efficient technologies. Policy reforms are still a long way to go. Approvals are slow, political pressures are still overbearing. Most SEBs are loss makers and market is still restricted. As a consequence, so far investors are not interested in private sector power generation in India.

Indian need for electrical power is quickly mounting. The capacity is boosted quickly but still lags behind demand. MNCs expertise in speedy networking and other efficient technologies can help in the transformation of the power sector. Use of new sophisticated machinery that boosts the stability of power supply can improve efficiency of electrically run machinery by a large amount and this is expected to boost the demand for Electrical Machinery sector.

This sector is dominated by the giant BHEL (86% of the market in 1998 – 99). BHEL has shown that it is possible to be competitive in the open market (after Liberalisation) by

- (i) having a motivated workforce
- (ii) prudent cash management (BHEL is virtually debt free)
- (iii) constant technological upgradation (JV with GE, strong R&D base)
- (iv) strategic alliance (GE, Siemens, ABB), also product market competition with these and doing it successfully.

BHEL has used technology transfer through licensing, business sharing, JV etc. Implication: BHEL has a very good order book position. Now it has got an expanding export market (over 55 countries including USA, New Zealand, Greece, Kuwait etc.). The export figures are impressive.

Pharmaceuticals

³ See Campbell, Lo and Mackinley, 1996 for details on this literature.

⁴ The discussion in this section is based on The Hindu (1999 – 2001) and Mookherji (1997).

From a mere processing industry three decades ago, pharmaceuticals have grown into a sophisticated sector with advanced manufacturing technology, modern equipment and stringent quality control.

The industry, vis-a-vis foreign firms, enjoys advantages like

- (i) lower production cost due to reverse engineering and minimal R&D,
- (ii) lower import cost due to indigenous raw material,
- (iii) low labour costs.

With the introduction of new, stricter patent rules (WTO, TRIPS), after 2005, the Indian pharmaceuticals industry will not be able to enjoy the benefits of reverse engineering as in the past.

Due to the long lag of R&D, only 5 Indian companies have undertaken any serious R&D. But this will have to be boosted using a closer government – academia – private sector interaction. The companies now must focus on research, marketing, cost efficient technologies, regional and transnational alignments. They must realize that “size does matter” as there are considerable scale economies in R&D. It is well known that R&D time is long in pharma. With the advent of combinatorial chemistry, this may reduce in the future. But policies are required for encouraging R&D.

Software

The Indian software industry has been witnessing impressive compounded growth rates of about 50% over the last decade. The National Association of Software and Services Companies (NASSCOM) estimated that the industry earned \$4 billion in exports in 1999-2000. This is probably the only globally competitive industry in the organised sector of India. This is largely due to the high quality and low cost of Indian software professionals. In the last 10 years, both due to the availability of professionals graduating from the premiere institutes in India and repatriation of some of the US taught professionals who decided to return, the industry has seen the emergence of some of the big companies who are truly global players (eg. Infosys, TCS, HCL, Wipro etc.).

India was probably the first developing country to target software as a thrust area. Export was encouraged and import was restricted earlier. Government of India gives priority to Indian firms for their software needs. The post 1991 era saw the economy-wide liberalization programme influencing policy in the software industry. With the Central and State governments automating their operations, the domestic software market is also likely to grow. India now also has a separate ministry for Information Technology.

Textiles

This is the oldest among all industries in India. It's the second largest employment provider and biggest export earner. The area under cotton cultivation is also the largest in the world.

Poor policy making on the part of the Government of India, in terms of tariff and cost structure, has impeded growth and improvement of the quality of cotton. This sector has always been characterized by very high labour-capital and labour-output ratios, much larger than optimal levels. Also, historically, govt. restricted expanding weaving capacity in the composite mill sector in the interest of handloom. Which resulted in obsolescence of textile industry and eventual dominance by power loom.

After Liberalization, now there is considerable competition from MNCs. So, technology intensive product development is required and R&D has become necessary. And also the need for efficient management has become more serious than ever before.

IIB. The Prowess Database

Prowess, compiled by the Centre for Monitoring the Indian Economy (CMIE), is a firm level database on Indian industry. It is broadly similar to the Compustat database of US firms. Prowess is being widely used for applied financial research in India, particularly for firm level analysis. This database has already been used for studying a variety of issues including the role of large shareholders in corporate governance in India (Sarkar and Sarkar, 1999, 2000), effect of group affiliation on the performance of a firm (Khanna and Palepu, 1999, 2000). The effect of foreign

ownership on performance (Chibber and Majumdar, 1999), impact of financial liberalisation on corporate investment (Khasnobis and Bhaduri, 1999 and Bhaduri, 1999) and role of development financial institutions as financial intermediaries (Bhandari, Dasgupta and Gangopadhyay, 2000).

The database consists of data on more than 7,500 firms, compiled from their current reports and various other sources. The selection criteria for a firm are not based on any formal sampling scheme but rather on availability and feasibility of data collection. A firm is included in Prowess if one of the following holds.

- (i) The firm has a turnover of more than Rs. 2.5 crores.
- (ii) The firm's annual reports are available for at least two latest years prior to the date of updating.
- (iii) The firm is listed on the National Stock Exchange.

The database includes a major part of large manufacturing firms and a relatively small proportion of the small or medium firms. Thus, it has a large coverage in terms of the output (80.3% in 1994-5) and gross value added (73.8% in 1995-6) in the industrial sector in India in terms of National accounts statistics. However, the coverage of Prowess in terms of the number of firms is small (about 4.6% of the Annual Survey of Industries, India coverage).

One important advantage with Prowess is that it is updated at least monthly, adding on more data on the existing firms in the database as well as adding new firms to it. With the ever-increasing coverage, the numbers of firms on which data are available for different years are different. As a result, composition of any sample data set extracted from Prowess is influenced by the choice of the years for which it is extracted.

Our selection of the sample of firms to be analysed is a trade off decision between sample size and the length of the time interval. For longer time series, the set of common firms decrease. We have decided on 5 or 6 years as the optimal length of time as that leaves us with a reasonable number of firms in each sector in our sample. The numbers are 104 for electrical machinery, 53 for pharmaceuticals, 34 for software and 68 for the textile sector.

IIC. The model

For our analysis we use a very simple statistical technique such as the ordinary least squares regression model and the correlation coefficients. We stick to linear analysis for two reasons. One, it is often seen that for qualitative analysis, which focuses on the sign, and not the magnitude, of the relationship, linear analysis gives excellent results and suffices for testing purposes. Secondly, the results of linear models are much more easily interpretable than more complicated non-linear models. Of course, due to the presence of influential outliers in some of the data, we sometimes take resort to a pre-cleaning of the data to remove those outliers. These are observations that are not representative of the broad relationship that shows up in the bivariate scatter plots but which unduly influences the regression or correlation analysis.

So our model is as follows. For each sector (Electrical machinery, Pharmaceuticals, Software and Textiles) and for each year on which we have data in our panel (1996 to 2000 or 2001), we fit the following regression model⁵.

$$\pi = a_0 + a_1 \cdot eq + a_2 \cdot kemp + a_3 \cdot ltd + a_4 \cdot std + a_5 \cdot impr + a_6 \cdot impk \\ + a_7 \cdot rdc + a_8 \cdot rdk + a_9 \cdot rdc(-1) + a_{10} \cdot rdk(-1) + \varepsilon$$

where π = profit

eq = equity capital

$kemp$ = capital employed

ltd (std) = long (short) term debt

$impr$ ($impk$) = import of raw materials (capital goods)

rdc (rdk) = R&D expenditure on capital (revenue) account

$rdc(-1)$ and $rdk(-1)$ = one year lagged values of rdc and rdk

and ε is the usual white noise term.

⁵ Note that this model is not selected on the basis of any optimization exercise, rather this analysis aims at finding direction for such an exercise particularly suitable for the scenario (essentially characterised by the incentive structures not observable by outsiders, the information structure and the loose contract enforcement mechanisms) in the developing countries, starting from a common sense specification.

We have used profit as an indicator of good governance. Evidently, this is not the only possibility. It might be an interesting exercise to extend the analysis of the present paper to multiple indicators of corporate governance in a (possibly) simultaneous equation set up.

All variables are expressed as proportion of the firm's net fixed assets. This is done to eliminate price, size and trend effects. For a discussion on the variables selected, see the following subsection.

We also study the correlation matrix for the relevant variables (the regression results, correlation matrices and other important statistical analyses are summarised at the end of this paper).

We considered fitting a fixed effect panel regression model to the data to check for time consistency of our results in a unified framework. But the data clusters for different years were found to be well separated and this kind of analysis turned out to be inappropriate. So we did not attempt this here. This also implies that the relationships among the variables under consideration are dynamic in nature.

IID. Variables Selected

We have selected a number of variables from the Prowess database for our analysis. We describe the major ones below.

(i) **Profit:**

This is net profit after tax. This may not always match with the companies annual report figures due to classification of some income or expense items by Prowess as of non-recurring nature.

(ii) **Import:**

We have taken data on import of raw materials (stores and spares etc.) and import of capital goods (plants and machinery) in value terms.

(iii) **R&D expenditure:**

Here, the variables studied are R&D expenditure on capital account (capital) and that on revenue account (current). These figures are procured from the disclosures under the companies rules (1988) and not from the income and expenditure statement of companies. As these are relatively small amounts, the companies often do not show these items separately in their expenditure statements.

(iv) **Equity capital:**

This is the total outstanding paid-up equity capital of the company at the end of the accounting period. Fresh issues and shares not paid-up are not included here.

(v) **Borrowings:**

This includes *total borrowings*, including all forms of debt, secured or unsecured. This is the net outstanding position at the end of the year. Also we consider *short term bank borrowings*, bank loans having a maturity of less than one year are classified in this. Usually this accounts for 75 – 80% of total bank borrowings. This is particularly important in estimating the company's current liabilities correctly. We use this as our proxy for the total short term borrowing of a firm. So we define *long term borrowing* as (*total borrowing – short term bank borrowing*) as a proxy for long term debt.

(vi) **Net fixed assets:**

These are the total fixed assets, net of accumulated depreciation, that are used for producing goods and services. These include movable as well as immovable assets. Fixed assets comprise a significant part of the total assets of an enterprise and therefore are important in determining the size of a firm.

(vii) **Capital employed:**

This is one of the derived variables in the Prowess database. We include this variable to check whether the management is prudent and sincere enough to employ the capital efficiently. The idea is as follows: if this variable has a significant positive effect on profit we can conclude that capital is being employed efficiently (the scale effect of the size of this variable will be controlled for as of all other variables), and so on. The definition of the variable is as follows:

$$\begin{aligned} \text{Capital employed} = & (\text{equity} + \text{preference}) \text{ capital} + \\ & (\text{reserves} - \text{revaluation reserves} - \text{expenditure to be amortized}) + \\ & (\text{total borrowing} - \text{short term bank borrowing} - \text{commercial paper}) \end{aligned}$$

(viii) We also looked at the data on various components of sales, wages, costs, exports, investments, distribution of equity, cash flow etc. to judge the relationships among the key variables. This helped us to decide on our final choice of model.

(ix) **Ownership structure:**

This is collected from the equity holding pattern fields in Prowess that gives us an idea about the proportional holding of shares by government companies, foreign investors, mutual funds (MF) etc. in any firm as well as ownership concentration and insider ownership.

For example, we have taken variables like equity shares held by (as percentage of total shares) government companies, directors, top 50 shareholders etc.

III. The Empirical Analysis

IIIA. The Hypotheses to be Tested

1. Utilisation of capital is a vital issue. If efficiently utilised, then capital use should be profit conducive. A higher proportion of capital employed should imply a higher rate of profit.
2. Debt creates leverage for a firm. Hence, a judicious use of debt should be such that if the firm increase its outstanding debt then the rate of profit should be non-decreasing, provided the debt increment decision has been the result of a properly defined optimisation problem.
3. Research and Development (R&D) is necessary for a firm in a competitive industry, more so after the Liberalisation steps taken by the Government of India in the last decade. The firms, especially in the new technology sectors like Pharmaceuticals, are now going for larger R&D investments to improve their production technology or to develop new products. If the managers or executives of a firm are behaving optimally, then the marginal productivity of R&D should be positive. So we can test for the hypothesis that an increase in R&D expenditure should improve profits.

Sometimes R&D is a forward-looking process. The investments that we make today bear fruit in the next period or even at longer horizons. The impact on profitability is usually not instantaneous. Hence we also test for the sign of marginal productivity of previous year's R&D on profit. Of course, just a one-year lag is not sufficient as the effects of R&D expenditure often takes hold after 3 or 4 years or even longer. For example, for the

Pharmaceuticals sector, this lag can be as long as 15 years! But, due to the paucity of data in our panel, we have not considered lags of more than one year.

4. Similarly, import decisions are also important in terms of demands on the firm's foreign exchange capacity. Hence, import decisions should be very carefully taken by the managers and monitored by an active board of directors. So we also test for the efficacy of import, of both raw materials and capital items, with respect to profitability.
5. The equity capital base of a firm is the third and often very crucial source of finance (after internal funds and debt). The decision about extending the equity capital base of a firm is normally taken as a last resort by an alert management. We finally check for the sign of the effect of equity on profitability.
6. Ownership patterns are very important for corporate governance. Often, a very closely held firm is actively governed because of better co-ordination among the shareholders and hence closer scrutiny by the directors, and sometimes due to the presence of significant stakes for the managers themselves in the firm. Thus we check for the relationship of profits and equity capital with shareholders concentration and directors' shareholding.

Also, a better-run firm is a target for investment by financial institutions (FIs), foreign institutional investors (FIIs), mutual funds (MFs) and other institutional investors. So we also check the relation between the profits of a firm and the proportional shareholding of these institutions in the firm. Thus our final set of hypotheses tests whether shareholding concentration, insider ownership, shareholding by the FIs, FIIs, MFs etc. are positively related to profit and equity capital variables.

III.C. The Results

The salient results for the analysis of each sector is presented below.

I. Electrical Machinery

- (i) Capital employed is seen to be conducive to profitability of the firms in aggregate for this sector. The coefficient of *kemp* is positive and statistically significant for all the years 1996 to 2001. This result is very emphatic in stating that, for this sector, the employment of capital has been, on average, in the right direction.
- (ii) Both long and short-term debt has significantly negative coefficients for most of the years (5 out of 6 for both, see table) in our regression. This result is alarming in the sense that issue of more debt is apparently damaging for a firm from the point of view of profitability. An explanation for this surprising finding may be found in the slackness of the banking system in our country in terms of loan recovery. As the principal source of credit, the nationalised banks in our country has been advancing large loans to the priority sectors of the economy, of which the electrical machinery is one. But, most of these loans are unrecovered. The total volume of non-performing assets⁶ of our nationalised banks is mind boggling (over Rs. 40,000 crores in 1996-7) most of which are loans forwarded to large houses in the priority sector. In fact, it has become a common ploy for the ill performing firms in those sectors to recycle debt from banks in the face of deteriorating performance. Thus the leverage argument do not seem to hold for this sector due to lack of appropriate recovery mechanism and accountability checks in the banking sector.
- (iii) We included 4 R&D variables in our regressions, two contemporaneous and two lagged. But in all of 6 regressions, only *rdc* came out to be significant (and positive) in the year 1998 only. Thus, overall, the impression is that R&D decisions are ineffective in terms of profitability of a firm for this sector, at least, for the lag we considered. The decision regarding R&D is not taken with careful deliberation with the firm's performance in mind but rather it is taken in a routine manner that does not effect the performance at all. This result is disappointing, more specifically in the wake of financial Liberalisation when R&D decisions have become a lot more important than before (as discussed earlier).
- (iv) Import of key raw materials often proved a profitable strategy for the heavy machinery sector of Indian industry in the past. This fact is borne out in our empirical exercise. For the earlier years, up to 1997, this kind of import enhanced the profitability of a firm. The importance seems to have decreased in the recent years, may be due to increasing

⁶ Loans on which interest or principal has not been paid for at least the last two quarters.

availability of such imports in the domestic market from MNC vendors who are now coming into the market.

Import of capital items (plant, machinery etc.) seems to be an item on which little thought is spared by the firms. Although key inputs under this heading can improve the performance of a firm in the machinery-producing sector significantly, like R&D. This fact seems to have been largely ignored by the managers in this sector. This does not signal good management or governance for this sector.

- (v) The decisions about the choice of equity capital are crucial, as we have already discussed. In this respect, we first look at the effect of an expansion in equity capital on profit. The regression shows this to be negative and significant for 3 out of the 6 years. The “+” sign in 1998 disappear if we drop one influential outlier data point. Also note that for the data of 1997 also, we did drop one very influential observation and the results that are presented here are based on the deleted data set. The original results, without the pre-cleaning, were dramatically different. The results imply that a profitable strategy for any firm seems to be to shrink the proportion of equity capital over time. We will now check whether this decision is influenced by ownership patterns.
- (vi) We now take a look at the correlation of eq and π with the principal ownership variables that we have data on for one particular year (2001 for our data set. Prowess does not provide this data for each year but only does so for the last available year.).

The correlation coefficients imply that equity expansion is negatively related to directors’ shareholding (but the relationship is not very strong), as a consequence, profitability of a firm increases with the directors’ shareholding (this is also borne out by the corresponding correlation). This augurs well in terms of corporate governance. A higher insider holding (stake of the monitors) induces better supervision and hence higher profits. In contrast, shareholding concentration is apparently detrimental to performance as shown by the relevant correlation. This may be due to the traditional closely held firms that are inefficiently run in terms of modernisation (information) or competitive attitude.

The holdings of FIIs and government companies are positively related with π , which shows their alertness in terms of profitable investment opportunities. On the other hand, FIs, MFs

and banks do not perform well in this respect. This has a somewhat mixed implication in terms of governance through external factors, in terms of attracting investment in the company. This, to some extent matches with recent empirical work based on US data that claims that MFs are historically not very good stock-pickers (Carhart, 1997). This evidence is discouraging but non-confirmatory as we have relevant data for one year only. Hence we do not place a lot of weightage on this piece of evidence.

II. Pharmaceuticals

- (i) The implication of our results in terms of *kemp* is exactly the same as for the electrical machinery sector, hence we need not reiterate the same discussion.
- (ii) The conclusion in terms of the effectiveness of debt holding in respect of profit induction is very weak for this sector. This is good in one sense that it does not support the implication of poor debt recovery as in the electrical sector but also bad in the sense of absence of leverage as we have already discussed.
- (iii) Again, R&D evidence for this sector is very similar to the earlier one but for one year (1996), *rdk* turns out to be detrimental for profits. This is a bad sign with respect to managerial alertness in R&D investment on capital account. Also, *rdc(-1)* has a negative sign in 1996, but this may have been caused by the variable's high collinearity ($r = 0.83$) with *rdc* for this year. The negative coefficient of *rdc(-1)* in 2001 is again surprising at first glance but it is actually due to collinearity with *kemp* for that year.
- (iv) Import conclusions are also very similar to the earlier sector. All the relevant coefficients turn out to be insignificant. So the conclusions are similar. In one sense, it is a positive signal for the self-dependence of our pharmaceuticals sector in the recent years.
- (v) Again equity capital related conclusions are similar to the electrical machinery sector.
- (vi) Here, both *eq* and π are negatively related with directors' shareholding. So, whereas the conclusions in terms of equity expansion are same as in electrical machinery, in contrast, insider holding by the directors for this sector adversely effects profitability of the firm.

This may be due to the fact that the shareholding of the directors in this sector are rigid for the worse performing firms and the directors are not very effective. Here also shareholding concentration is detrimental to profitability and a similar explanation may be given.

Again FIIs do a good job in stock-picking in this sector and now FIs and MFs are also doing very well in contrast to the electrical machinery sector.

III. Software

- (i) *Kemp* has again a significantly positive role for most of the years.
- (ii) Debt has a stronger negative impact (coefficients are negative significant for most of the years and insignificant otherwise) on profitability in this sector, which implies an explanation similar to that for the electrical sector.
- (iii) The implication of R&D activity is much more pronounced in this sector and here we have a clear differentiation between the effects of R&D on capital account and that on the revenue account. Whereas *rdk* is detrimental to profits, *rdc* has (in 2 out of 5 years) a positive impact on profitability of firms in the software sector. This is a somewhat mixed result and implies some alertness on the part of the managers in handling the current account R&D but on the other hand, the capital account R&D is very badly managed on an average. This may have major policy implications for this sector.

The sign of the previous year R&D variables are reversed in the years when they turned out to be significant. This is surprising but it is seen on inspection that there is substantial collinearity between the R&D variables and their lagged versions. This may have caused the sign reversal. Thus these signs are likely to be unstable and hence unreliable.

- (iv) Again, the role of import is mostly positive, where it is significant, in terms of profit for this sector. The significance of the coefficients is more frequent. The only exception being the negative sign of raw material import in 1996 which does not match the usual pattern here. But overall, the conclusion seems to be that the usage of import (and hence foreign exchange) has been well done in this sector.

- (v) In contrast with the earlier two sectors, now the proportion of equity plays a less detrimental role to profitability. It also appears with a positive significant coefficient in the regression model for the software sector in the year 1999. The negative sign in 1997 is due to the presence of an influential outlier in the data. On removing this observation the coefficient becomes insignificant. Hence this negative sign is not too serious an observation.

So by and large, for this sector, expansion of equity is a good sign for a firm.

- (vi) When we look at the correlation coefficients, the effect of directors' shareholding and shareholding concentration is same as that in the electrical machinery sector. The explanations would be similar.

In terms of institutional investors, the only difference with the results in the electrical sector is that here the government companies are doing badly. The other patterns are broadly similar.

IV. Textiles

- (i) Again *kemp* has a positive role in this sector too but the incidence is now less frequent (only 2 out of 5 coefficients are significant).
- (ii) For this sector debt plays a positive role and leveraging argument seems to hold for this sector. This is an initially surprising result as all the sectors are functioning in the same institutional setting after all. But this may be due to the fact that, historically, the government of India has been tight fisted about the profit making large-scale textile manufacturers in favour of the small mills, which were highly inefficient (we have discussed this before). The positive coefficients for 4 out of 5 years are indeed pleasant findings.
- (iii) R&D come out with a stronger negative role for this sector. All the significant coefficients are negative (the positive sign for *rdk* in 1998 again changes sign and becomes insignificant

if we drop one outlier observation). R&D allocations are apparently done in a very non-optimal manner in this sector. One of the reasons could be wasting huge amounts of money in developing products that are actually cheaper to import or that have cheaper substitutes. In the textile sector, one of the main items of research is developing threads with more advanced user friendly features. This kind of research can be a huge source of loss if not planned properly or ill directed. This fact comes out quite starkly in the coefficients of R&D and its lagged versions.

- (iv) Import is found to exert little effect on profitability in this sector implying an almost total lack of optimal decision making behaviour on the part of the managers with respect to the use of foreign exchange. This is again a bad signal as discussed for the electrical machinery sector.
- (v) The conclusions for equity are again similar to that of the electrical machinery or the pharmaceuticals sector.
- (vi) For this sector, directors' shareholding exerts a negative effect on both equity expansion and profit. The conclusions would be similar to the pharmaceuticals sector. The shares are very widely held in this sector. The measure of concentration, percentage of shareholding for the top 50 shareholders, shows the value of zero for all the firms in the sample. Thus we can not relate this with eq or π .

The performance of FIIs is again good and MFs and FIs seems to do a bad selection job again.

IV Conclusion

Corporate governance mechanisms have been an important issue of enquiry for the researchers in financial economics. The agency problem of the problem due to the separation of ownership and control, which is starkly manifested in the corporate sector, is discussed in this literature. Both theoretical models and empirical analysis have been developed in this area to explain the occurrence of different contractual mechanisms and their efficacy in terms of improving managerial performance. Mechanisms like performance sensitive pay, employees' stock option,

insider ownership has been tested and researched extensively. A related issue in this literature is the independence and competence of the Board of Directors. This is also a target of considerable attention in recent years.

The Indian corporate scenario was more or less stagnant till the early 90s while the “license raj” was prevalent and the oiling culture was pervasive. But, after the liberalisation of the 90s, the position and goals of the Indian corporate sector changed a lot. The consumers got an upper hand in the face of stiffer product market competition where the MNCs also participated.

This paper, using only balance sheet information, analyses the efficacy of corporate governance in terms of inducing the firms’ managers to take optimal decisions. The data is from 4 selected sectors of the Indian industry. We constructed a balanced panel of a reasonable number of firms and length of time for each sector and used linear regression model and correlation analysis to test our hypotheses.

Our findings, by and large, paint a disappointing picture. These findings imply that for most of the sectors, the R&D and import decisions are taken very non-optimally. R&D investments seem to have hardly any effect on the profitability of a firm. Also, debt leverage does not seem to work for the Indian industry. The decisions to issue debt are not performance enhancing as for an efficient sector. Directors’ shareholding and shareholding concentration, the factors which are supposed to enhance shareholders activism and alertness of the BoD, are also ineffectual for most of the sectors.

Overall, the conclusion seems to be that corporate governance is still in a very nascent stage in the Indian industry. The decision and policy making is still taken mostly as a routine matter. The management is also not yet on its feet and their operating decisions may be more effected by culture and tradition rather than scientific optimisation or sound business sense.

Among the institutional investors also, it seems that the FIIs are the most consistent in stock picking whereas the performances of the domestic institutional investors are sporadic and volatile at best. This is also serious shortcoming on the part of the capital market, not being able to enforce better governance on the part of the directors or performance on the part of the managers.

Due to the lack of systematic data, we have been unable to analyse the efficacy of alternative incentive mechanisms for the managers directly. With the recent surge of attention to this area of research, probably more detailed data on such variables will become available in future and researchers will be able to look at this issue more closely.

References

- Alchian, A. (1950): Uncertainty, Evolution and Economic Theory, *Journal of Political Economy*, 58, 211 – 21.
- Baker, G. M. Jensen and K. Murphy (1988): Compensation and Incentives: Practise versus theory, *Journal of Finance*, 43, 593 – 616.
- Bhaduri, S. (1999): Do Indian Firms Follow the Pecking Order Hypothesis?, *International Journal of Development Banking*, 17.
- Bhandari, L., S. Dasgupta and S. Gangopadhyay (2000): Development Financial Institutions as Financial Intermediaries, mimeo.
- Brealey, R.A. and S.C. Myers (1997): *Principles of Corporate Finance*, Tata McGraw Hill.
- Cadbury Report (1992): *The Financial Aspects of Corporate Governance*, Burgess Science Press.
- Campbell, J.Y., A.W. Lo and A.C. Mackinley (1996): *The Econometrics of Financial Markets*, Princeton University Press, Princeton, New Jersey.
- Carhart, M.M. (1997): On Persistence in Mutual Fund Performance, *Journal of Finance*, 52, 57 – 82.
- Chibber, P.K. and S.K. Majumdar (1999): Foreign Ownership and Profitability: Property Rights, Control and the Performance of Firms in Indian Industry, *Journal of Law and economics*, 42, 209 – 38.

Coase, R. (1937): The Nature of the Firm, *Economica*, 4, 386 – 405.

Coase, R. (1960): The Problem of Social Cost, *Journal of Law and Economics*, 3, 1 – 44.

Conyon, M.J. and G.V. Sadler (2001): CEO Compensation, Option Incentives and Information Disclosure, *Review of Financial Economics*, 10, 251 – 77.

Denis, D.K. (2001): Twenty-five Years of Corporate Governance Research... and Counting, *Review of Financial Economics*, 10, 191 – 212.

Fama, E. and M. Jensen (1983): Separation of Ownership and Control, *Journal of Law and Economics*, 26, 327 – 49.

Holderness, C.G. (2001): A Survey of Blockholders and Corporate Control, *Economic Policy Review*, forthcoming.

Hull, R.A. and J. Mazacheck (2001): Junior-for-Senior Announcements: A Study of the Role of Inside Ownership, *Review of Financial Economics*, 10, 213 – 25.

Jensen, M. and W. Meckling (1976): Theory of the Firm: Managerial Behavior, Agency Costs, and Ownership Structure, *Journal of Financial Economics*, 3, 305 – 60.

Khanna, T. and K. Palepu (1999): Policy Shocks, Market Intermediaries and Corporate Strategy: The Evolution of Business houses in Chile and India, *Journal of Economics and Management Strategy*, 8, 271 – 310.

Khanna, T. and K. Palepu (2000): Is Group Affiliation Profitable in Emerging Markets? An Analysis of Diversified Indian Business Groups, *Journal of Finance*, 55, 867 – 91.

Khasnabis, B.G. and S. Bhaduri (1999): A Critical Appraisal of the Effects of Financial Liberalization on Corporate Investment: India 1990 – 1995, *International Journal of Development Banking*, 17, 3 - 11.

Mookherji, D. (1997): Indian Industry, Policies and Performance, (Ed.), Oxford India Paperbacks.

Morck, R., A. Shleifer and R. Vishny (1989): Alternative Mechanisms for Corporate Control, American Economic Review, 79, 842 – 52.

Murphy (1999): Executive Compensation, in O. Ashenfelter and D. Card (Eds.) Handbook of Labor Economics, 3, Amsterdam: North Holland.

Roy, M. (1999): Mergers and Takeovers: The Indian Scene during the 1990s, in A. K. Bagchi (Eds.), Economy and Organization: Indian Institutions under the Neoliberal Regime, Sage, New Delhi.

Roychowdhury, P. and I. Roychowdhury (2001): Joint Venture Life Cycle, International Journal of Industrial Organization,

Sarkar, J. and S. Sarkar (1999): The Governance of Indian Companies, in K.S. Parikh (Ed.) India Development Report, 1999-2000, Oxford University Press, New Delhi.

Sarkar, J. and S. Sarkar (2000): Large Shareholder Activism in Corporate Governance in Developing Countries: Evidence from India, International Review of Finance, 1, 161 – 94.

Shleifer, A. and R. Vishny (1997): A Survey of Corporate Governance, Journal of Finance, 52, 737 – 83.

Stigler, G. (1958): The Economies of Scale, Journal of Law and Economics, 1, 54 – 71.

The Hindu (1999 - 2001): The survey of Indian Industries.

Tirole, J. (1988): Industrial Organization, Cambridge, MIT Press.

Tirole, J. (1999): Lecture Notes on Corporate Finance, preliminary draft.

Table showing summarized regression results for the sector Electrical Machinery:

Obs=104	eq	rdk	rdc	kemp	ltd	std	impr	impk	rdk(-1)	rdc(-1)
1996 ⁷ (0.9746)	-1.934135 -3.268 0.002	2.174772 0.082 0.935	1.658145 0.872 0.385	.1228994 8.515 0.000	-1.859454 -4.126 0.000	-.1067722 -1.491 0.139	.1463617 2.908 0.005	-.3697976 -1.152 0.252	-1.001648 -0.173 0.863	-.4632237 -0.275 0.784
1997 ⁸ (0.5539)	-.4056358 -3.371 0.001	-4.06098 -0.416 0.678	-1.35437 -0.185 0.854	.3839979 10.522 0.000	-.5301622 -4.755 0.000	-.4812026 -3.973 0.000	.1586337 1.831 0.070	-.3835684 -0.433 0.666	-2.504615 -0.390 0.697	3.585679 0.407 0.685
1998 (0.5355)	.3131658 6.979 0.000	-2.03769 -0.677 0.500	3.2077 1.998 0.049	.0811245 2.876 0.005	-.0226122 -0.320 0.750	-.1213969 -1.720 0.089	-.0169335 -0.284 0.777	.4538928 0.688 0.493	6.898698 1.495 0.138	-.9218613 -0.415 0.679
1999 (0.6674)	-.0274036 -0.498 0.620	6.914737 1.147 0.254	-1.87047 -0.565 0.574	.2053818 9.569 0.000	-.293226 -3.917 0.000	-.2530701 -2.827 0.006	.034603 0.441 0.660	.7144679 1.230 0.222	-2.568838 -0.530 0.598	.5597123 0.227 0.821
2000 (0.8318)	-.0629246 -1.460 0.148	2.551452 1.633 0.106	.2943715 0.477 0.634	.1787337 9.508 0.000	-.1238673 -2.056 0.043	-.3436455 -6.455 0.000	.075267 1.120 0.265	.2568776 0.503 0.616	-3.631932 -0.960 0.339	-.3190582 -0.142 0.888
2001 (0.5665)	-.1012297 -1.907 0.060	-.175699 -0.045 0.964	-2.10722 -0.771 0.442	.1336967 6.327 0.000	-.1100454 -1.946 0.055	-.2089482 -3.636 0.000	.0927196 1.291 0.200	.3969341 0.729 0.468	-.235326 -0.118 0.906	1.222366 0.611 0.543

In each cell we have tabulated in the following order:

Coefficient
t-value
P>|t|

⁷ obs=103, since nfa=0 for 1 observation.

⁸ obs=102, since nfa=0 for 1 observation and one outlier dropped.

Table showing summarized regression results for the sector Pharmaceutical:

Obs=53	eq	rdk	rdc	kemp	ltd	std	impr	impk	rdk(-1)	rdc(-1)
1996 (0.5785)	-4.098224 -3.085 0.004	-8.95337 -2.108 0.041	11.79207 2.148 0.038	.4454059 4.946 0.000	.4587211 1.497 0.142	-.734556 -2.575 0.014	-.0857316 -0.326 0.746	.7173398 0.324 0.748	3.235916 0.813 0.421	-30.2482 -2.960 0.005
1997 (0.8930)	-.0808866 -1.638 0.109	-.042181 -0.025 0.980	6.559335 4.880 0.000	.1402598 3.984 0.000	-.1065205 -1.559 0.126	.0977416 1.355 0.183	-.1040597 -1.485 0.145	.5928947 0.785 0.437	-.7205188 -0.293 0.771	-3.902674 -1.258 0.215
1998 (0.7857)	-.1109032 -2.573 0.014	.9106708 0.893 0.377	.2791732 0.160 0.873	.0946607 3.713 0.001	-.027888 -0.547 0.587	.0568349 0.833 0.409	-.0778713 -0.926 0.360	1.203853 1.705 0.096	.0092237 0.008 0.994	2.03423 1.218 0.230
1999⁹ (0.6464)	-.1185282 -2.295 0.027	1.047207 0.764 0.449	1.788833 0.605 0.548	.1214507 4.946 0.000	-.1602877 -1.534 0.133	.0597473 0.636 0.528	-.063339 -0.620 0.539	1.246745 1.331 0.190	1.956712 1.271 0.211	-1.307789 -0.335 0.739
2000 (0.8156)	-.1297138 -3.040 0.004	.3412787 0.231 0.818	.0410791 0.033 0.974	.1666673 7.845 0.000	-.137111 -2.682 0.010	-.0013494 -0.017 0.987	.0905881 0.899 0.374	.1600092 0.049 0.962	1.615343 1.562 0.126	.7939656 0.503 0.617
2001 (0.2027)	-.1287454 -0.982 0.332	2.458446 0.590 0.558	.990837 0.637 0.527	.257889 3.929 0.000	-.1683685 -1.064 0.293	-.2684871 -1.185 0.243	-.0627662 -0.153 0.879	-4.599381 -0.832 0.410	7.127104 1.136 0.262	-6.770029 -1.743 0.089

In each cell we have tabulated in the following order:

Coefficient

t-value

P>|t|

⁹ obs=52,since nfa=0 for 1 observation.

Table showing summarized regression results for the sector Software:

Obs=34	eq	rdk	rdc	kemp	ltd	std	impr	impk	rdk(-1)	rdc(-1)
1996 (0.6010)	-.0005813 -0.012 0.991	-1.93122 -1.722 0.097	.0957328 0.051 0.959	.5183537 6.490 0.000	-.5027638 -6.504 0.000	.3500521 1.391 0.176	-.2153619 -1.985 0.058	1.284139 1.611 0.120	*	*
1997 (0.6253)	-.2916174 -5.342 0.000	-7.57077 -0.881 0.387	3.388534 2.010 0.056	.3160152 5.315 0.000	-.4232208 -3.187 0.004	.0726261 0.514 0.612	.0026607 0.051 0.960	1.729116 2.016 0.056	15.88619 1.150 0.262	-4.511307 -2.002 0.057
1998 (0.7634)	-.2319132 -4.629 0.000	1.282464 0.700 0.491	-2.05032 -0.810 0.426	.2475999 4.530 0.000	-.5820208 -3.281 0.003	-.4933424 -3.858 0.001	-.0101538 -0.133 0.895	1.308426 1.423 0.168	1.175904 0.167 0.869	.7145633 0.287 0.777
1999 (0.7261)	.308643 3.487 0.002	-23.9002 -1.906 0.069	6.34706 4.712 0.000	.0447317 0.855 0.402	-.2218816 -0.996 0.330	-1.02747 -5.509 0.000	.1622267 1.909 0.069	1.130664 1.273 0.216	15.29911 1.757 0.092	-7.954116 -2.676 0.013
2000 (0.2870)	.2168666 1.411 0.172	-.879852 -0.116 0.909	1.160612 0.336 0.740	.0713703 1.464 0.157	.1024596 0.260 0.797	-.5302601 -1.790 0.087	-.0198796 -0.138 0.892	2.471634 2.068 0.050	.8220055 0.059 0.954	-2.378209 -0.546 0.590

In each cell we have tabulated in the following order:

Coefficient

t-value

P>|t|

Table showing summarized regression results for the sector Textile:

<u>Obs=68</u>	eq	rdk	rdc	kemp	ltd	std	impr	impk	rdk(-1)	rdc(-1)
<u>1996</u> (0.3756)	-.1224801 -2.306 0.025	2.227722 1.648 0.105	25.28678 0.778 0.440	.1271812 2.661 0.010	.040245 3.200 0.002	-.0977048 -1.416 0.162	.0678935 0.440 0.662	.1117142 0.417 0.678	-5.847545 -0.747 0.458	-35.48803 -1.045 0.301
<u>1997</u> (0.5301)	-.028518 -0.477 0.635	3.845903 0.472 0.639	-15.4299 -0.430 0.669	.0493225 0.807 0.423	.116625 8.295 0.000	.0890379 1.124 0.266	.1438583 0.826 0.412	.225425 0.664 0.509	-.7598965 -0.705 0.484	11.02885 0.349 0.729
<u>1998</u> (0.6150)	-.0465859 -0.437 0.664	38.97029 2.500 0.015	-1.49666 -0.019 0.985	.1277147 1.475 0.146	.18561 10.489 0.000	.0213254 0.143 0.887	.0714155 0.279 0.781	.2827874 0.505 0.616	-74.31438 -4.353 0.000	7.631601 0.097 0.923
<u>1999</u> (0.1825)	.1961818 0.857 0.395	105.948 1.190 0.239	7.768142 0.320 0.750	.0996441 0.637 0.526	-.0547665 -2.017 0.048	-.5919773 -1.662 0.102	-.0915823 -0.154 0.878	-.4734541 -0.268 0.790	-74.11927 -1.433 0.157	-142.1758 -2.854 0.006
<u>2000</u> (0.6592)	-.539579 -4.148 0.000	-192.411 -9.087 0.000	-.190457 -0.019 0.985	.1665286 1.706 0.093	.1251424 7.257 0.000	-.1379138 -0.873 0.386	.3365557 2.059 0.044	-.4821714 -0.399 0.691	64.94161 1.623 0.110	1.689496 0.041 0.968

In each cell we have tabulated in the following order:

Coefficient

t-value

P>|t|

Table showing Correlation coefficients for Electrical machinery, 2000

	π	eq	rdk	rdc	kemp	ltd	std	impr	impk	rdk(-1)	rdc(-1)
π	1.0000										
eq	-0.0714	1.0000									
rdk	0.1152	-0.0560	1.0000								
rdc	0.6742	0.0333	0.2170	1.0000							
kemp	0.8314	0.1744	0.0668	0.7990	1.0000						
ltd	-0.2585	0.2658	-0.0875	-0.1355	-0.0398	1.0000					
std	-0.4761	0.3325	0.0283	-0.0288	-0.1530	0.2725	1.0000				
impr	0.2670	0.0326	0.0519	0.2822	0.2774	-0.3341	0.1402	1.0000			
impk	0.0812	-0.0889	0.0099	-0.0561	0.0116	0.0176	-0.1224	0.1805	1.0000		
rdk-1	-0.0336	-0.0768	0.6074	0.1011	-0.0560	-0.1157	0.0269	-0.0224	0.0373	1.0000	
rdc-1	0.5539	-0.0413	0.3266	0.8613	0.6438	-0.1995	0.0162	0.3932	-0.0703	0.2915	1.0000

Table showing Correlation coefficients for Pharmaceutical, 2000:

	π	eq	rdk	rdc	Kemp	lte	ste	impR	impK	rdk(-1)	rdc(-1)
π	1.0000										
eq	-0.1306	1.0000									
rdk	0.1411	-0.1761	1.0000								
rdc	0.6718	-0.0937	0.2333	1.0000							
kemp	0.8480	0.1752	0.0275	0.6745	1.0000						
lte	-0.1515	0.0012	0.2462	-0.0564	0.0055	1.0000					
std	-0.1851	0.1796	-0.0790	-0.1920	-0.1335	0.0326	1.0000				
impr	0.4238	-0.2906	0.5493	0.2734	0.2933	0.0935	-0.1186	1.0000			
impk	0.1138	-0.3050	0.6720	0.2317	-0.0395	0.0647	-0.2184	0.4568	1.0000		
rdk-1	0.2213	-0.2232	0.4089	0.1285	0.0364	0.0608	-0.0240	0.2658	0.2103	1.0000	
rdc-1	0.7241	-0.1116	0.1767	0.7942	0.6942	-0.0947	-0.2729	0.3210	0.2362	0.2401	1.0000

Table showing Correlation coefficients for Software, 2000:

	π	eq	rdk	rdc	kemp	ltd	std	impr	impk	rdc(-1)	rdc(-1)
π	1.0000										
eq	-0.0907	1.0000									
rdk	-0.2006	-0.0366	1.0000								
rdc	-0.1800	-0.1211	0.4905	1.0000							
kemp	0.5034	-0.0500	-0.1048	-0.2337	1.0000						
ltd	-0.2478	-0.0394	0.3234	0.1690	-0.0945	1.0000					
std	-0.4222	0.7929	0.2113	0.0372	-0.3384	0.3087	1.0000				
impr	-0.1719	0.4122	0.4212	0.0714	0.0626	0.5800	0.5130	1.0000			
impk	0.3407	-0.1535	0.1306	0.1095	0.0129	0.0128	-0.1650	-0.1272	1.0000		
rdc-1	-0.0203	-0.1592	0.0907	0.3539	-0.0826	0.3690	-0.1188	-0.1079	0.1448	1.0000	
rdc-1	-0.1739	-0.1641	0.4162	0.8459	-0.2413	0.2858	-0.0249	0.0391	0.1689	0.6203	1.0000

Table showing Correlation coefficients for Textile, 2000:

	π	eq	rdk	rdc	Kemp	lte	ste	impr	impk	rdk(-1)	rdc(-1)
π	1.0000										
eq	-0.2096	1.0000									
rdk	-0.4318	-0.0855	1.0000								
rdc	-0.0661	0.1457	0.0194	1.0000							
kemp	0.3111	0.2902	-0.0052	0.0313	1.0000						
ltd	0.0954	0.0105	0.6122	0.0010	-0.0545	1.0000					
std	-0.0105	0.5617	0.0005	0.1431	0.6233	-0.0299	1.0000				
impr	0.3598	0.2163	-0.0227	0.0245	0.8528	-0.0641	0.5058	1.0000			
impk	0.0201	-0.2374	0.0347	-0.0626	0.0420	-0.0657	-0.0817	-0.0175	1.0000		
rdk-1	0.0218	-0.0822	0.1047	-0.0394	0.0093	-0.0365	0.0053	-0.0291	0.1868	1.0000	
rdc-1	-0.1024	0.1024	0.0999	0.9641	0.0013	0.0378	0.1167	0.0198	-0.0756	-0.0449	1.0000

Tables showing correlation of eq and π with shareholding pattern variables.

Electrical Machinery:

	eq	π
foreign_	-0.0857	0.1621
fin_inst	-0.2599	-0.1652
insuranc	-0.0583	-0.0298
mutual_f	-0.2596	-0.1055
banks_sh	-0.0408	-0.1210
govt_cos	0.5475	0.1172
corpn_sh	-0.1112	-0.1091
director	-0.0811	0.0725
top50_sh	0.5270	-0.1408

Pharmaceutical:

	eq	π
foreign_	-0.0685	0.1874
fin_inst	-0.2705	0.2244
insuranc	0.2362	-0.0329
mutual_f	-0.2937	0.2105
corpn_sh	0.0880	-0.1645
director	-0.1941	-0.1716
top50_sh	0.2362	-0.0329

Software(Profit2000-Share holding2001)¹⁰:

	eq	π
foreign_	-0.0616	0.0004
fin_inst	0.0205	-0.2433
insuranc	0.2481	-0.2050
mutual_f	-0.2223	-0.0202
banks_sh	-0.0239	0.1908
govt_cos	-0.0771	-0.2327
corpn_sh	0.7195	-0.0532
director	-0.3481	0.0964
top50_sh	0.0478	-0.2863

Textile(Profit2000-Share holding2001)⁷:

	eq	π
foreign_	0.0504	0.0192
fin_inst	-0.0966	-0.1635
insuranc	-0.0284	-0.0242
mutual_f	-0.2874	-0.2344
banks_sh	-0.1143	-0.0062
corpn_sh	0.2133	0.2373
director	-0.2395	-0.0483
top50_sh	0.9069	0.8518

¹⁰ For these two sectors, matching year was not possible due to lack of enough observations pertaining to the same year on relevant variable.